SECTION C

INDEX TO VOLUME 20

Authors

Adams, G. A.—See Ledingham, G. A.

Adams, G. A. and Ledingham, G. A.—Biological decomposition of chemical lignin.
I. Sulphite waste liquor, 1.
III. Application of a new ultra-violet spectroscopic method to the estimation of sodium lignosulphonate in culture media, 101.

Allardyce, J. and Milsom, D.—Carotene in feed grasses, 85.

Anderson, J. A.—See Paull, A. E.

Blair, I. D.—Studies on the growth in soil and the parasitic action of certain *Rhizoctonia Solani* isolates from wheat, 174.

Boothroyd, E. R.—See Smith, S. G.

Brodie, H. J.—Protoplasmic continuity in the powdery mildew *Erysiphe graminis* DC., 595.

Brodie, H. J. and Neufeld, C. C.—The development and structure of the conidia of *Erysiphe Polygoni* DC. and their germination at low humidity, 41.

Carlyle, R. E. and Newton, J. D.—Peat and commercial fertilizers as amendments for gray wooded soils, 68.

Clendenning, K. A.—Polarimetric determination of starch in cereal products. I. Rapid determination of starch in crude gluten, 403.
The respiratory and ripening behaviour of the tomato fruit on the plant, 197.

Crowell, I. H.—Two new Canadian smuts, 327.

Dowding, E. S. and Gowan, E. H.—The migration of fungal nuclei in an electric field, 92.

Farrar, J. L. and Grace, N. H.—Vegetative propagation of conifers.
XI. Effects of type of cutting on the rooting of Norway spruce cuttings, 116.
XII. Effects of media, time of collection, and indolylacetic acid treatment on the rooting of white pine and white spruce cuttings, 204.

Gibbs, R. D.—Studies in tree physiology. III. The effect of the method of cutting on the water content of twigs. A note on a paper by McDermott, 236.

Gowan, E. H.—See Dowding, E. S.

Grace, N. H.—See Farrar, J. L.

Graham, V. E. and Hastings, E. G.—Studies on film-forming yeasts. II. Film-forming yeasts in rennet brine, 63.

Gralén, N.—See McCalla, A. G.

Hagborg, W. A. F.—Classification revision in *Xanthomonas translucens*, 312.

Hastings, E. G.—See Graham, V. E.

Hutcheson, I.—See Thompson, W. P.

James, N. and Sutherland, M. L.—Are there living bacteria in permanently frozen subsoil?, 228.
Individual plot studies of variation in numbers of bacteria in soil.
I. Response to cropping, 435.
II. The errors of the procedure, 444.

Johns, C. K.—The behaviour of resazurin in milk, 336.

Johnson, L. P. V.—Studies on the relation of growth rate to wood quality in *Populus* hybrids, 28.

Johnson, L. P. V. and Linton, G. M.—Experiments on chemical control of damping-off in *Pinus resinosa* Ait., 559.

Katznelson, H.—Inhibition of micro-organisms by a toxic substance produced by an aerobic spore-forming bacillus, 169.

A staining technique for evaluating the toxicity of an antibiotic substance of microbiological origin, 602.

Kenway, C. B., Peto, H. B., and Neatby, K. W.—Researches on drought resistance in spring wheat. II. The effect of time of day on survival of plants during exposure to artificial drought, 397.

Leach, W.—Studies on the metabolism of cereal grains. I. The output of carbon dioxide by wheat grains during absorption of water and germination, 160.

Ledingham, G. A.—See Adams, G. A.

Ledingham, G. A. and Adams, G. A.—Biological decomposition of chemical lignin. II. Studies on the decomposition of calcium lignosulphonate by wood destroying and soil fungi, 13.

Linton, G. M.—See Johnson, L. P. V.

Lochhead, A. G.—*Zygosaccharomyces nectarophilus* n. sp. and *Zygosaccharomyces rugosus* n. sp., 89.

McCalla, A. G. and Gralén, N.—Ultracentrifuge and diffusion studies on gluten, 130.

Machacek, J. E. and Wallace, H. A. H.—Non-sterile soil as a medium for tests of seed germination and seed-borne disease in cereals, 539.

Macrae, R.—Interfertility studies and inheritance of luminosity in *Panus stypticus*, 411.

Mead, H. W.—Environmental relationships in a seed-borne disease of barley caused by *Helminthosporium sativum* Pammel, King, and Bakke, 525.

Host-parasite relationships in a seed-borne disease of barley caused by *Helminthosporium sativum* Pammel, King, and Bakke, 501.

Milsom, D.—See Allardyce, J.

Neatby, K. W.—See Kenway, C. B.

Neufeld, C. C.—See Brodie, H. J.

Newton, J. D.—See Carlyle, R. E.

Nobles, M. K.—Secondary spores in *Corticium effuscatum*, 347.

Paull, A. E. and Anderson, J. A.—The effects of amount and distribution of rainfall on the protein content of western Canadian wheat, 212.

Peto, F. H. and Young, G. A.—Hybridization of *Triticum* and *Agropyron*. VII. New fertile amphidiploids, 123.

Peto, H. B.—See Kenway, C. B.

Phillips, J. H. H.—Three strains of cucumber mosaic occurring on tobacco in Ontario and Quebec, 329.

Radforth, N. W.—On the fructifications and new taxonomic position of *Dactylotheca parallela* Kidston, 186.

Richardson, J. K.—Studies on root rot of corn in Ontario, 241.

Ross, J. G.—See Semeniuk, W.

Semeniuk, W. and Ross, J. G.—Relation of loose smut to yield of barley, 491.

Smith, S. G. and Boothroyd, E. R.—Polarization and progression in pairing. I. Interlocking of bivalents in *Trillium erectum* L., 358.

Sparrow, A. H.—The structure and development of the chromosome spirals in microspores of *Trillium*, 257.

Sutherland, M. L.—See James, N.

Thatcher, F. S.—Further studies of osmotic and permeability relations in parasitism, 283.

Thompson, W. P. and Hutcheson, I.—Chromosome behaviour and fertility in diploid wheat with translocation complexes of four and six chromosomes, 267.

Wallace, H. A. H.—See Machacek, J. E.

Wang, Y. C.—Rust reactions of Chinese wheat varieties and certain Canadian hybrid strains, 108.

Wehmeyer, L. E.—Contributions to a study of the fungous flora of Nova Scotia. VI. Pyrenomycetes, 572.

Welsh, M. F.—Studies of crown rot of apple trees, 457.

White, W. L.—A new hemiascomycete, 389.

Young, G. A.—See Peto, F. H.

SECTION C

INDEX TO VOLUME 20

Subjects

Actinomyces, See Fungi.

Aerobe, Inhibition of micro-organisms by a toxic substance produced by a spore-forming, 169.

Agropyron, New fertile amphidiploids of Triticum and, 123.

Alfalfa, Effect of fungi from corn roots on, 244.

Alternaria, See Fungi.

Amphidiploids of Triticum and Agropyron, 123.

Antirrhinum sp., as host for cucumber mosaic, 331.

Aphids, as possible carriers of cucumber mosaic, 334.

Apiognomonia guttulata, See Fungi.

Apium graveolens, Effect of fungi on permeability of, 285, 287, 294.

Apple, Crown rot of, 457.

Ascomycetes, See Fungi.

Asterotheca parallela, a new combination, 186.

Bacillus, See Fungi (Bacteria).

Bacteria, See Fungi.

Barley
- Chemical changes during development of spike of, 506.
- Effect of crops of, on bacteria in soil, 435, 444.
- Effect of seed infection on development of plants of, 516.
- Environmental relationships in disease of, 525.
- Germination of infected seed of, 513.
- Histological studies of kernels of, 507.
- Host–parasite relationships in seed-borne disease of, 501.
- Relation of loose smut to yield of, 491.
- Seed
  - Development and structure of healthy, 504.
  - Effect of infection of, by Helminthosporium, on barley plants, 516.

Barley—*concluded*
- Seed—*concluded*
  - Host–parasite relationships in disease of barley borne by, 501.
  - Infected with Helminthosporium, Histological studies of, 507.
  - Spread of Helminthosporium from, to soil, 516.
  - Structure and development of, 504.
  - Treatment of, with loose smut, in yield experiments, 492.

Basidiomycetes, See Fungi.

Bivalents of Trillium erectum, Interlocking in, 358.

Bombardia lutea, See Fungi.

Botrytis cinerea, See Fungi.

Brassica rutabaga, Effect of Erysiphe Polygoni on permeability of, 285, 287, 294.

Buckwheat, Effect of fungi from corn roots on, 244.

Burrillia anomala, See Fungi.

Calcium lignosulphonate, Decomposition of, by fungi, 1, 13.

Capsicum frutescens, as host for cucumber mosaic, 331.

Carbon dioxide
- Output of, by wheat grains during absorption of water and germination, 160.
- Relation of, to germination of mildew conidia, 55.

Carotene in feed grasses, 85.

Celery, Effect of fungi on permeability of, 285, 287, 294.

Cellulose in Populus wood, 37.

Cereals, See Wheat.

Chaetosphaeria multiseptata, See Fungi.

Chlamydospores, See Fungi.

Chromosomes
- Behaviour of, in diploid wheat, 267.
- Interlocking of bivalents in Trillium erectum, 358.
- Spiralization of, in Trillium microspores, 257.

Colchicine, Production of amphidiploids in Triticum by, 123.

Conidia, See Fungi.

Conidiophore, Development of, in Erysiphe Polygoni, 45.

Conifers, See Propagation.

Corn
- Development and root flora of cover crops in root rot soil of, 246.
- Effect of cover crops on development of, in root rot soil, 247.
- Effect of crops of, on bacteria in soil, 435, 444.
- Effect of fungi from roots of, on various plants, 244.
- Effect of fungi on germination and growth of, 243.
- Fungi isolated from roots of, 243.
- Root rot of, in Ontario, 241.

Corticium effuscatum and C. microsporum, See Fungi.

Cotton, Effect of, on nitrate nitrogen content of mineral soils, 80.

Crops, See Bacteria and Corn.

Crown rot of apple trees, Studies in, 457.

Cryptospora aurantiaca, See Fungi.

Cucumber mosaic, See Virus.

Cucumis Virus 1 on tobacco, 329.

Cuttings, See Propagation.

Dactylotheca parallela, Fructifications and taxonomic position of, 186.

Damping-off, Chemical control of, in Pinus resinosa, 559.

Datura Stramonium, as host for cucumber mosaic, 331.

Debaryomyces, See Fungi (Yeasts).

Diaporthe quadruplex, See Fungi.

Diffusion studies on gluten, 130.

Diploids, Fertile amphi-, of Triticum and Agropyron, 123.

Disease
- in cereals, Non-sterile soil as medium for tests of seed-borne, 539.
- See Barley.

Drought resistance in spring wheat, 397.

Endoconidiophora adiposa, See Fungi.

Entyloma peninsulae, See Fungi.

Environment, Effect of conditions of, on Helminthosporium barley disease, 525.

Erysiphe, See Fungi.

Fallow, Effect of, on bacteria in soil, 435, 444.

Fertility in diploid wheat, 267.

Fertilizer as amendment for soil, 68.

Fibres, Wood, Dimensions of, in Populus, 31, 33, 34.

Film-forming yeasts, See Fungi (Yeasts).

Flour, Gluten of
- Polarimetric determination of starch in, 403.
- Ultracentrifuge and diffusion studies of, 130.

Fraxinus, Effect of method of cutting on water content of twigs of, 237.

Fructifications of Dactylotheca parallela, 186.

Fruit, Tomato, Respiratory and ripening behaviour of, 197.

Fungi
- Actinomyces, Inhibition of, by a toxic substance, 170.
- Alternaria
  - Effect of, on decomposition of calcium lignosulphonate, 16.
  - Lignin loss in media by growth of, 105.
- Apiognomonia guttulata, a new combination, 585.
- Bacteria
  - Inhibition of micro-organisms by a toxic substance produced by a bacillus, 169.
  - in milk, Behaviour of resazurin as test for, 336.
  - in soil
    - Effect of various crops on, 435, 444.
    - Errors in plate count method of estimating, 444.
    - Occurrence of, in frozen subsoil, 228.
    - Plot studies of variation in numbers of, 435, 444.
  - Phytomonas translucens
    - f. sp. undulosa transferred to Xanthomonas, 317.
    - var. secalis transferred to Xanthomonas, 317.
  - Serological studies of forms of, 323.
  - Staining technique for evaluating toxicity of an antibiotic substance produced by a bacillus, 602.
  - Xanthomonas translucens
    - cultural studies of forms of, 318.

Fungi—*continued*
Bacteria—*concluded*
Xanthomonas translucens—*concluded*
New combinations
f. sp. cerealis, 317.
f. sp. undulosa, 317.
New special forms
f. sp. cerealis, 317.
f. sp. hordei, 317.
f. sp. hordei-avenae, 317.
Bombardia lutea, a new combination, 576.
Botrytis cinerea, Effect of, on permeability of its host, 285, 287, 294.
Burrillia anomala, a new Canadian smut, 327.
Chaetosphaeria multiseptata, a new pyrenomycete species, 576.
Conidia of mildews, See Erysiphe.
Corticium
effuscatum, Secondary spores in, 347.
microsporum, A new hemiascomycete on, 389.
Crown rot of apple trees, 457.
Cryptospora aurantiaca, A new pyrenomycete species, 588.
Diaporthe quadruplex, A new pyrenomycete species, 590.
Effect of fungi from corn roots on various hosts, 244.
Effect of fungi on germination and growth of corn, 243.
Endoconidiophora adiposa, Decomposition of lignin in sulphite waste liquor by, 1.
Entyloma peninsulae, a new Canadian smut, 328.
Erysiphe
graminis
Protoplasmic continuity in, 595.
Septal pores in, 597.
Polygoni
Conidia and conidiophores of, 41, 45.
Effect of, on permeability of its host, 285, 287, 294.
Fungicides, Use of, in control of crown rot of apple, 488.
Fungi from corn roots, Species of, 243.
Fungus parasites, Osmotic and permeability relation of host and, 283.
Fusarium
bulbigenum var. Lycopersici, See F. Lycopersici.
Effect of species of, on decomposition of calcium lignosulphonate, 16, 105.
Lycopersici, Effect of, on permeability of its host, 286, 288, 301.
Root rot of corn and, in Ontario, 241.
Gelasinospora tetrasperma, Conductivity of electricity in, 92.

Fungi—*continued*
Gibberidea alnea, a new combination, 586.
Helicogonium Jacksonii, a new hemiascomycete, 390.
Helminthosporium
sativum
Environmental relationships in barley disease caused by, 525.
Host–parasite relationships in barley disease caused by, 501.
Infection of seed by, Effect on development of barley plants, 516.
Root rot of corn and, in Ontario, 241.
Spread of, from barley seed to soil, 516.
teres, Non-sterile soil used for tests of, in cereals, 539.
Hemiascomycetes, A new species of, 389.
Infection by fungi, Effect of, on respiration of germinating wheat seeds, 166.
Inhibition of micro-organisms by a toxic substance produced by an aerobic spore-forming bacillus, 169.
Loose smut, Relation of, to yield of barley, 491.
Lycopersicum esculentum, Effect of fungi on permeability of, 286, 288, 301.
Massaria salilliformis, A new pyrenomycete species, 586.
Micro-organisms, See Bacteria and Yeasts.
Neurospora tetrasperma
Conductivity of, to an electric current, 95.
Effect of electric current
on development of, 97.
on movement of nuclei in, 98.
Nuclei of fungi, Migration of, in an electric field, 92.
Olpidium Brassicae in corn roots, 243.
Panus stypticus, Interfertility studies and inheritance of luminosity in, 411.
Parasitism, Osmotic and permeability relations in, 283.
Phoma lingam, Effect of, on permeability of its host, 285, 286, 298.
Physalospora Laricis, A new pyrenomycete species, 584.
Phytophthora
cactorum, Crown rot of apple and, 457.
infestans, Effect of, on permeability of its host, 286, 287, 298.
Pleospora nitida, a new combination, 585.
Polyporus dichrous, Sodium lignosulphonate content of media after growth of, 105.
Poria subacida, Sodium lignosulphonate content of media after growth of, 105.
Pseudotrichia viridicoma, a new combination, 579.

Fungi—*concluded*
Puccinia
glumarum, Reaction of two Canadian wheats to, 111.
graminis Tritici
on Chinese and Canadian wheats, 108.
Permeability of wheat as affected by, 285, 286, 289.
triticina, on Chinese and Canadian wheats, 108.
Pyrenomycetes of Nova Scotia, 572.
Pythium and root rot of corn in Ontario, 241.
Rhizoctonia Solani
Growth and parasitic action of, from wheat, 174.
Use of, in toxicity test, 604.
Root rot
of corn and Helminthosporium, in Ontario, 241.
of corn, Parasites causing, 241.
soil, Fungi in roots of plants grown in, 245.
Rust, Leaf and stem, on Chinese and Canadian wheats, 108.
Sclerotinia Sclerotiorum, Effect of, on permeability of its host, 283, 287, 294.
Smuts, Two new Canadian, 327.
Soil fungi, Effect of, on decomposition of calcium lignosulphonate, 18.
Spores, Secondary, in Corticium effuscatum, 347.
Staining technique for evaluating the toxicity of an antibiotic substance of microbiological origin, 602.
Wood destroying, Effect of, on decomposition of lignosulphonate, 19, 105.
Xylaria coprophila, A new pyrenomycete species, 592.
Yeast(s)
Debaryomyces, Species of, in rennet brine, 63.
Film-forming, in rennet brine, 63.
New species of, 89.
Schizosaccharomyces pombe used in evaluating toxicity of substance produced by a bacillus, 602.
Zygosaccharomyces
nectarophilus, a new species, 89.
rugosus, a new species, 89.

Fusarium, See Fungi.

Gelasinospora tetrasperma, See Fungi.

Germination
of conidia of powdery mildews, 51.
of corn, Effect of fungi on, 243.
of seeds, Non-sterile soil as medium for tests of, 539.
Output of carbon dioxide by wheat grains during, 160.

Gibberidea alnea, See Fungi.

Gluten, See Wheat.

Grain, See Wheat.

Grasses, Carotene in feed, 85.

Growth
of corn, Effect of fungi on, 243.
of Debaryomyces, Effect of pH on, 65.
of Endoconidiophora, Effect of period of, on lignin decomposition, 4.
of Rhizoctonia from wheat, in soil, 174.
of tomato fruit, Changes in respiration rate associated with, 198.
Rate of, Relation to wood quality in Populus, 28.

Helicogonium, See Fungi.

Helminthosporium, See Fungi.

Hemiascomycetes, See Fungi.

Heterothallism in Panus stypticus, 411.

Hormones, Phyto-, Effect on propagation of coniferous cuttings, 204.

Humidity, See Moisture.

Hybrids
Amphidiploid, of Triticum and Agropyron, 123.
See Wheat.

Indolylacetic acid, Effect of, on propagation of conifers, 204.

Insects as possible carriers of cucumber mosaic, 334.

Interfertility in Panus stypticus, 411.

Interlocking of bivalents in Trillium erectum, 347.

Leptosphaeria anisomeres, See Fungi.

Lignin
Biological decomposition of chemical
I. Sulphite waste liquor, 1.
II. Studies on the decomposition of calcium lignosulphonate by wood destroying and soil fungi, 13.
III. Application of a new ultra-violet spectroscopic method to the estimation of sodium lignosulphonate in culture media, 101.
in Populus wood, 37.

Loose smut, See Fungi.

Luminosity, Inheritance of, in Panus stypticus, 411.

Lycopersicon, See Lycopersicum.

Lycopersicum, See Fungi, Tomato, and Virus.

Macrosiphum gei, as possible carrier of cucumber mosaic, 334.

Massaria salilliformis, See Fungi.

Meiosis, See Chromosomes.

Metabolism of cereal grains, Studies on, 160.

Micro-organisms, See Fungi.

Microspores of Trillium, Chromosome spirals in, 257.

Mildew(s), See Fungi.

Milk, Behaviour of resazurin in, 336.

Moisture
- Effect of, on barley disease caused by Helminthosporium, 526.
- Germination of mildew conidia at low humidity, 51.
- Relation of humidity to damping-off in pine and spruce, 561.
- Soil
  - Bacterial response to, 446.
  - Effect of, on corn root rot pathogens, 252.
  - Influence of, on crown rot of apple, 465, 482.

Mosaic, See Virus.

Mottle, See Virus.

Necrosis, See Virus.

Neurospora, See Fungi.

Neutral red used in evaluating toxicity of an antibiotic substance, 602.

Nicandra physalodes, as host for cucumber mosaic, 331.

Nicotiana, Species of, as host for cucumber virus, 331.

Nicotiana Virus 1, See Virus.

Nitrification, Effect of soil amendments on, 71, 74, 76, 78.

Nitrogen
- Effect of, on germination of mildew conidia, 57.
- Effect of peat, straw, and cotton on content of, in soil, 80.

Norway pine, See Pine.

Norway spruce, See Spruce.

Nuclei, Migration of fungal, in an electric field, 92.

Oats, Effect of fungi from corn roots on, 244.

Olpidium, See Fungi.

Optical properties of Populus pulp, 38.

Osmosis in relation to parasitism, 283.

Oxygen, Relation to germination of mildew conidia, 57.

Panus stypticus, See Fungi.

Paper tests of Populus wood, 37.

Parasites, See Fungi.

Peat
- As an amendment for soil, 68.
- Effect of, on nitrate nitrogen content of mineral soils, 80.
- Effect of, on propagation of cuttings, 204.

Permeability in relation to parasitism, 283.

Petunia sp. as host for cucumber mosaic, 331.

pH
- Effect of, on growth of Debaryomyces, 65.
- of soil, Relation to damping-off in pine, 564.

Phoma lingam, See Fungi.

Photometer, Ultra-violet, Use of, in estimation of sodium lignosulphonate, 102.

Physalis angulata, as host for cucumber virus, 331.

Physalospora Laricis, See Fungi.

Phytohormones, See Hormones.

Phytolacca decandra, as host for cucumber mosaic, 331.

Phytomonas, See Fungi (Bacteria).

Phytophthora, See Fungi.

Picea, See Spruce.

Pine
- Norway (Pinus resinosa), Chemical control of damping-off in, 559.
- Red, See Pine, Norway.
- Seed of, Treatment of, to control damping-off, 562, 565, 567.
- White (Pinus strobus), Propagation of, 204.

Pinus
- resinosa, See Pine, Norway.
- strobus, See Pine, White.

Plasmolysis of conidia of Erysiphe Polygoni, 50.

Pleospora nitida, See Fungi.

Plot studies of variation in numbers of bacteria in soil, 435, 444.

Polarization in pairing of chromosomes, 358.

Polyploidy, Fertile amphidiploids of Triticum × Agropyron produced by colchicine, 123.

Polyporus dichrous, See Fungi.

Populus, Growth rate and wood quality in P. alba, P. grandidentata, P. tremuloides, and in their hybrids, 28.

Pores, Septal, in Erysiphe graminis, 597.

Poria subacida, See Fungi.

Potato
- Permeability in, Effect of fungi on, 286, 287, 300.
- X virus of, Cucumber mosaic in relation to, 333.

Potentiometer, used in testing milk with resazurin, 336.

Powdery mildew(s), See Fungi.

Progression in pairing of chromosomes, 358.

Propagation of conifers, Vegetative
- Rooting of Norway spruce cuttings, Effects of time of cutting on, 116.
- Rooting of white pine and white spruce cuttings, 204.

Protein, See Wheat.

Protoplasm
- Continuity of, in Erysiphe graminis, 595.
- Streaming of, in Erysiphe graminis, Search for, 600.

Pseudotrichia viridicoma, See Fungi.

Puccinia, See Fungi.

Pulp tests of Populus wood, 37.

Pyrenomycetes, See Fungi.

Pythium, See Fungi.

Rainfall, Effect of, on protein content of western Canadian wheat, 212.

Rape, Effect of fungi from corn roots on, 244.

Red, See Neutral.

Red pine, See Pine, Norway.

Rennet brine, Film-forming yeasts in, 63.

Resazurin, Behaviour of, in milk, 336.

Respiration
- of tomato fruit, Changes in, associated with growth and ripening, 197.
- of wheat grains, Changes in, during absorption of water and germination, 161.

Rhizoctonia, See Fungi.

Ring spot, See Virus.

Ripening behaviour of tomato fruit on the plant, 197.

Root rot of corn in Ontario, 241.

Rot, See Root rot.

Rubber, Toxicity of vulcanized, to mildew conidia, 58.

Rusts(s), See Fungi.

Rye, Effect of fungi from corn roots on, 244.

Sand, Effect of, on propagation of cuttings, 204.

Schizosaccharomyces pombe, See Fungi.

Sclerotinia Sclerotiorum, See Fungi.

Sedimentation, Study of gluten by, 130.

Seed, See Barley and Pine.

Seed bed, Effect of firmness of, on barley disease caused by Helminthosporium, 529.

Seed-borne diseases in cereals, Non-sterile soil as medium for tests of, 539.

Seed germination, Non-sterile soil as medium for tests of, 539.

Seeding, Effect of, on yield of barley, 497.

Smut(s), See Fungi.

Soda pulp, See Pulp.

Sodium lignosulphonate, Estimation of, by ultra-violet spectrographic method, 101.

Soil(s)
- Amendments for gray wooded, 68.
- atmosphere, Effect of, on Helminthosporium barley disease, 532.
- Bacteria in, 435, 444.
- Bacteria in frozen sub-, 228.
- Fertilization of, Effect on barley disease, 531.
- fungicides, Use of, for crown rot of apple, 488.
- Growth of Rhizoctonia Solani in, 174.
- microflora, Effect of, on barley disease, 525.
- moisture
  - Effect of, on corn root rot pathogens, 252.
  - Effect of, on crown rot of apple, 465.
- Non-sterile. as medium for seed tests, 539.
- pH of, Relation to damping-off in pine, 564.
- Phytophthora cactorum in, 477.
- Plot studies of bacteria in, 435, 444.

Soil(s)—*concluded*
temperature
Effect of, on corn root rot pathogens, 252.
Effect of, on crown rot of apple, 465.
treatment in control of damping-off in pine, 562, 565, 567.

Solanum tuberosum, Effect of fungi on permeability in, 286, 287, 300.

Solanum Virus 1, Cucumber mosaic in relation to, 333.

Soybeans
Effect of crops of, on bacteria in soil, 435. 444.
Effect of fungi from corn roots on, 244.

Sparganium diversifolium, New Canadian smut on, 327.

Specific gravity of Populus wood, 34.

Spectrograph, Use of, in estimation of sodium lignosulphonate, 102.

Spectrum, Ultra-violet, Use of, in estimation of sodium lignosulphonate, 101.

Sporeformer, See Fungi.

Spores, See Fungi.

Spruce
Norway, Rooting of, 116.
White
Chemical control of damping-off in, 559.
Propagation of, 204.

Staining technique for evaluating toxicity of an antibiotic substance, 602.

Starch, Polarimetric determination of, in gluten, 403.

Straw, Effect on nitrate nitrogen content of mineral soils, 80.

Subsoil, See Soil.

Sugar beets
Effect of crops of, on bacteria in soil, 435, 444.
Effect of fungi from corn roots on, 244.

Swedes, See Turnip.

Tannic acid reaction in relation to lignin decomposition, 24.

Temperature
Barley disease as affected by, 526.
Damping-off in spruce and pine in relation to, 561.
of incubation of Endoconidiophora adiposa, Effect of, on lignin decomposition, 4.
of soil
Effect of, on corn root rot pathogens, 252.
Effect of, on crown rot of apple, 465.

Tilia, Effect of method of cutting on water content of twigs of, 237.

Time of day, Effect on survival of wheat plants during drought, 397.

Timothy, Effect of fungi from corn roots on, 244.

Tobacco, Cucumber mosaic on, in Ontario and Quebec, 329.

Tomato
Cucumber mosaic on, 329.
Effect of fungi from corn roots on, 244.
Effect of fungi on permeability of, 286, 288, 301.
Respiratory and ripening behaviour of fruit of, 197.

Trees, Effect of method of cutting on water content of twigs of, 236.

Trillium
Chromosome spirals in microspores of T. erectum and T. grandiflorum, 257.
Interlocking of bivalents in T. erectum, 358.

Triticum, See Wheat.

Turnip, Swede, Effect of fungi on permeability of, 285, 286, 294.

Twigs, Effect of method of cutting on water content of, 236.

Ulmus, Effect of method of cutting on water content of twigs of, 237.

Ultracentrifuge studies on gluten, 130.

Ultra-violet photometer, See Photometer.

Ultra-violet spectrum, Use of, in estimation of sodium lignosulphonate, 101.

Ustilago nuda, See Fungi.

Vigour index of Populus hybrids, 30.

Virus, Cucumber mosaic
in relation to: Lycopersicum Virus 1, 333.
Nicotiana Virus 1, 333.
Solanum Virus 1 (potato X Virus), 333.
on tobacco in Ontario and Quebec, 329.

Water
content of twigs, Effect of method of cutting on, 236.
Output of carbon dioxide by wheat grains during absorption of, 160.

Wheat
Amphidiploids of Triticum × Agropyron, 123.
Chromosome behaviour and fertility in, 267.

Wheat—*continued*
crops, Effect of, on bacteria in soil, 435, 444.
Drought resistance
in Triticum durum, 397.
in Triticum vulgare, 397.
Effect of fungi from corn roots on, 244.
Flour
Polarimetric determination of starch in gluten, 403.
Ultracentrifuge and diffusion studies of gluten of, 130.
Gluten of, See Wheat flour.
grains of, Output of carbon dioxide by, during absorption of water and germination, 160.
Osmotic relations of parasitic fungi and, 283, 286, 289.
Permeability relations of parasitic fungi and, 283, 286, 289.
Protein of
Effect of rainfall on, in western Canada, 212.
See Wheat flour.
Rhizoctonia Solani isolates from, 174.
Species of
Rust reactions of, 108.
used in hybridization with Agropyron, 123.

Wheat—*concluded*
Strains of, Canadian, Rust reactions of, 108.
Varieties of, Chinese, Rust reactions of, 108.
Yield of, Effect of soil amendments on, 71, 74, 76, 78.

White pine, See Pine.

White spruce, See Spruce.

Wood, See Lignin and Twigs.

Wood fibres, See Fibres.

Wood quality, Relation of growth rate to, in Populus, 28.

Xanthomonas, See Fungi (Bacteria).

Xylaria coprophila, See Fungi.

Yeast(s), See Fungi.

Zinnia sp. as host for cucumber mosaic, 331.

Zizania aquatica, A new Canadian smut on, 328.

Zygosaccharomyces, See Fungi (Yeasts).

CANADIAN JOURNAL OF RESEARCH

VOLUME 20
1942

SECTION D

CANADA

Published by the
NATIONAL
RESEARCH COUNCIL
of CANADA

SECTION D

INDEX TO VOLUME 20

Authors

Allen, D. E.—See Collier, H. B. and Swales, W. E.

Armstrong, F. H.—See Hayes, F. R.

Ashton, G. C.—See Swales, W. E.

Battle, H. I.—Hepatogenesis of the Atlantic salmon (*Salmo salar* L.), 79.

Berkeley, C.—See Berkeley, E.

Berkeley, E. and Berkeley, C.—North Pacific Polychaeta, chiefly from the west coast of Vancouver Island, Alaska, and Bering Sea, 183.

Black, V. S.—The effect of asphyxiation under various tensions of carbon dioxide on the swim bladder gases of some freshwater fish, 209.

Buckby, L.—See Reedman, E. J.

Charnley, F. and Goard, D. H.—On the use of the pH value as a measure of the freshness of fish muscle tissue, 20.

Choquette, L.—See Swales, W. E.

Collier, H. B.—See Swales, W. E.

Collier, H. B. and Allen, D. E.—The haemolytic action of phenothiazine derivatives, 283.

Cook, W. H.—See White, W. H.

Crampton, E. W.—See Swales, W. E.

Crandall, W. A.—See Pugsley, L. I.

Dunbar, M. J.—Marine macroplankton from the Canadian eastern Arctic.
I. Amphipoda and Schizopoda, 33.
II. Medusae, Siphonophora, Ctenophora, Pteropoda, and Chaetognatha, 71.

Fallis, A. M.—The life cycle of *Apanteles carpatus* (Say) (Hymenoptera:Braconidae), a parasite of the webbing clothes moth, *Tineola bisselliella* Hum., 13.

Fisher, K. C.—The effect of temperature on the critical oxygen pressure for heart-beat frequency in embryos of Atlantic salmon and speckled trout, 1.

Fletcher, D. A.—See Rosser, F. T.

Fulton, C. O.—See Gibbons, N. E.

Gibbons, N. E.—See White, W. H.

Gibbons, N. E., Fulton, C. O., and Hopkins, J. W.—Preservation of eggs. IV. Storage of oiled and bagged eggs under constant and alternating temperatures and humidities, 306.

Glenny, F. H.—Main arteries in the region of the neck and thorax of the Australian cassowary, 363.

Goard, D. H.—See Charnley, F.

Gwatkin, R. and Moynihan, I. W.—Search for sources and carriers of equine encephalomyelitis virus, 321.

Hayes, F. R. and Armstrong, F. H.—Physical changes in the constituent parts of developing salmon eggs, 99.

Hopkins, J. W.—See Gibbons, N. E. and Reedman, E. J.

Kelly, J. T.—See Pugsley, L. I.

Legault, R. T.—See Reedman, E. J.

Little, G. E.—See McLeod, J. A.

McLeod, J. A. and Little, G. E.—Continued studies on cercarial dermatitis and the trematode family Schistosomatidae in Manitoba. Part I, 170.

Maw, W. A. and Nikolaiczuk, N.—The effect of ethyl alcohol and tricresol on the vitamin A content of the blood and liver of the chicken, 47.

Morrell, C. A.—See Pugsley, L. I.

Moynihan, I. W.—See Gwatkin, R.

Munro, J. A.—Studies of waterfowl in British Columbia. Buffle-head, 133.

Nikolaiczuk, N.—See Maw, W. A.

Pearce, J. A. and Thistle, M. W.—Fluorescence as a measurement of quality in dried whole egg powder, 276.

Peters, H. S.—See Shortt, T. M.

Pugsley, L. I., Kelly, J. T., Crandall, W. A., and Morrell, C. A.—The vitamins A and D potency of the oils obtained from the liver, intestines, body, and offal of shad, *Alosa sapidissima* Wilson, and mackerel, *Scomber scombrus* L., 167.

Reed, G. B. and Toner, G. C.—*Proteus hydrophilus* infections of pike, trout, and frogs, 161.

Reedman, E. J., Buckby, L., and Legault, R. T.—The vitamin C (ascorbic acid) content of canned chicken, 230.

Reedman, E. J. and Hopkins, J. W.—Preservation of eggs. III. Studies on the effect of oil treatment and egg-case liner bags in the preservation of shell eggs under adverse conditions, 297.

Rosser, F. T.—Preservation of eggs. II. Surface contamination on egg-shell in relation to spoilage, 291.

Rosser, F. T., White, W. H., Woodcock, A. H., and Fletcher, D. A.—Preservation of eggs. I. Treatments for maintaining quality in shell eggs at ordinary temperatures, 57.

Russell, H. D.—A new species of *Onchidiopsis* from Baffin Land, 50.

Shortt, T. M. and Peters, H. S.—Some recent bird records from Canada's eastern Arctic, 338.

Smith, S. G.—Polarization and progression in pairing.

II. Premeiotic orientation and the initiation of pairing, 221.

III. Pachytene observations in *Neodiprion* (Hymenoptera), 368.

Swales, W. E., Collier, H. B., and Allen, D.—Effects of phenothiazine on horses. I. Studies in haematology and pharmacology, 349.

Swales, W. E., Crampton, E. W., Ashton, G. C., and Choquette, L.—Studies on factors influencing the health of pigs. I. The relationship of blood haemoglobin concentrations to rate of gain in suckling pigs, 380.

Swales, W. E., Sylvestre, P. E., and Williams, S. B.—Field trials of control measures for parasitic disease of sheep, 115.

Sylvestre, P. E.—See Swales, W. E.

Thistle, M. W.—See Pearce, J. A.

Toner, G. C.—See Reed, G. B.

Walker, M. G.—A mathematical analysis of the distribution in maize of *Heliothis armigera* Hb. (*obsoleta* F.), 235.

White, W. H.—See Rosser, F. T.

White, W. H., Gibbons, N. E., Woodcock, A. H., and Cook, W. H.—Smoked meats. II. Bacteriological, chemical, and physical measurements on smoked and unsmoked bacon, 263.

Williams, S. B.—See Swales, W. E.

Woodcock, A. H.—See Rosser, F. T. and White, W. H.

SECTION D

INDEX TO VOLUME 20

Subjects

Alcohol, Ethyl, Effect on vitamin A content of blood and liver of chicken, 47.

Alosa sapidissima, See Shad.

Ameiurus nebulosus, See Bullhead.

Amnicola, examined for presence of cercariae, 174.

Amphipoda, See Plankton.

Anaemia
- produced in horses by phenothiazine, 349.
- Rate of gain of young pigs in absence of, 380.

Anthelmintic(s)
- as control measures for parasitic diseases of sheep, 115.
- Effect of phenothiazine on horses when used as, 349.

Apanteles carpatus, See Insects.

Arctic, Canada's eastern, Bird records from, 338.

Arteries in region of neck and thorax of Australian cassowary, 363.

Ascorbic acid content of canned chicken, 230.

Asphyxiation, Effect of, on swim bladder gases of freshwater fish, 209.

Assassin bug, See Insects.

Bacon, Smoked and unsmoked, Bacteriological, chemical, and physical measurements on, 263.

Bacteria
- As egg contaminants, 293, 300, 307.
- Effect of concentration of sodium chloride in cover pickle on growth of, 267.
- Effect of method of cure and other factors on growth of, on bacon, 269.
- Proteus hydrophilus infections of fish and frogs, 161.

Bass, Northern smallmouth, Effect of asphyxiation on swim bladder gases of, 209.

Bile salt haemolysis of horse erythrocytes, 288.

Birds
- Arteries in region of neck and thorax of Australian cassowary, 363.
- Records of, from Canada's eastern Arctic, 338.
- See Buffle-head.

Blood
- Chicken, Effect of ethyl alcohol and tricresol on vitamin A content of, 47.
- haemoglobin concentrations, Relationship of, to rate of gain in suckling pigs, 380.
- Horse, Effect of phenothiazine on, 283, 349.
- Sheep, Effect of phenothiazine on, 283.
- vessels, See Arteries.

Body of shad and mackerel, Vitamin A and D potency of, 167.

Boll-worm, See Insects.

Braconidae, See Insects (Apanteles).

British Columbia, Studies of waterfowl in, 133.

Buffle-head in British Columbia
- Behaviour of females and young, 146.
- Colour of soft parts of, 151.
- Courtship of, 140.
- Food and feeding habits, 152.
- Mating of, 142.
- Moults and plumages of, 148.
- Sex ratio of, 147.
- Spring and autumn migration of, 134, 138.
- Summer and winter populations of, 134, 138.

Bug, See Insects.

Bullhead, Northern brown, Effect of asphyxiation on swim bladder gases of, 209.

Canada, Bird records from eastern Arctic region of, 338.

Carbon dioxide
- Effect of asphyxiation under various tensions of, on swim bladder gases of freshwater fish, 209.
- Use of, in preserving eggs, 57.

Carotene in blood and liver of chicken, Effect of ethyl alcohol and tricresol on, 47.

Cassowary, Australian, Main arteries in region of neck and thorax of, 363.

Casuarius australis, Arteries of, 363.

Cat, as possible carrier of encephalomyelitis, 321.

Catostomus commersonii, See Sucker.

Cells, See Erythrocytes.

Cercaria, Species of, in snails and other hosts, 174, 175, 182.

Cercaria dermolestes, Relation to life cycle of Pseudobilharziella, 180.

Cercarial dermatitis, See Dermatitis.

Cercaria physella, Relation of Pseudobilharziella querquedulae to, 180.

Chaetognatha from the Canadian eastern Arctic, 75.

Charitonetta albeola in British Columbia, 133.

Chicken
- Blood and liver of, Effect of ethyl alcohol and tricresol on vitamin A content of, 47.
- Canned, Vitamin C content of, 230.
- Non-infection of, by cercariae, 175.

Chromosomes
- of Diptera, Premeiotic orientation and initiation of pairing in, 221.
- of Neodiprion, Observations of, at pachytene, 368.

Chub, Northern creek, Effect of asphyxiation on swim bladder gases of, 209.

Citellus richardsoni, See Squirrel.

Colour of bacon, Changes in, during storage, 273, 274.

Cooperia, Control of, in sheep, 115.

Corn, Analysis of distribution of Heliothis armigera in, 235.

Crickets, See Insects.

Crow, as possible carrier of encephalomyelitis, 321.

Ctenophora from the Canadian eastern Arctic, 75.

Culex tarsalis, See Insects (Mosquito).

Cythaemolytic icterus produced in horses by phenothiazine, 349.

Dace, Finescale, Effect of asphyxiation on swim bladder gases of, 209.

Dafila acuta, Pseudobilharziella in, 180.

Dermacentor andersoni, See Insects (Tick).

Dermatitis, Cercarial, and the trematode family Schistosomatidae in Manitoba, 170.

Dimethylol urea, Use of, in preserving eggs, 57.

Diptera, See Insects.

Duck
- As possible carrier of encephalomyelitis, 321.
- Pin-tail, Occurrence of Pseudobilharziella in, 180.
- Sea, See Buffle-head.
- Spoon-billed, Occurrence of Pseudobilharziella in, 180.
- Teal, Non-infection of, by cercariae, 175.

Egg(s)
- Oiled and bagged, Storage of, under constant and alternating temperatures and humidities, 306.
- powder, Fluorescence as a measurement of quality in, 276.
- Preservation of, as affected by oil treatment and egg-case liner bags under adverse conditions, 297.
- Salmon
  - Changes in capsule of, during development, 101.
  - Physical changes in developing, 99.
- Shell of, Surface contamination of, in relation to spoilage, 291.
- Sterile artificial, Method of preparing, 59.
- Treatment of, for storage experiments, 57, 292, 298, 307.

Embryo
- of salmon, Changes in, during development, 109.
- of salmon and trout, Effect of temperature on critical oxygen pressure for heartbeat frequency in, 1.

Encephalomyelitis virus, Search for sources and carriers of, 321.

Erythrocytes
- of horse blood, Effect of phenothiazine on, 283, 349.
- of sheep blood, Effect of phenothiazine on, 283.

Eucalia inconstans, See Stickleback.

Ferrous sulphate, Effect of, on weight of young pigs, 380.

Fish
Freshwater, Effect of asphyxiation on swim bladder gases of, 209.
Mackerel oil, Vitamin A and D potency of, 167.
Muscle tissue of, Use of pH as measure of, 20.
Salmon
Development of liver in, 79.
eggs, Physical changes in developing, 99.
embryos, Effect of temperature on critical oxygen pressure for heart-beat frequency in, 1.
Trout, Proteus hydrophilus infections of, 161.

Flavour
of bacon, Effect of smoking on, 273.
of dried egg powder, Fluorescence as a measure of, 279.

Fluorescence as a measurement of quality in dried whole egg powder, 276.

Frogs, Proteus hydrophilus infections of, 161.

Fungi
as egg contaminants, 293.
Inhibition of growth of, on eggs at ordinary temperatures, 57.

Gases, Swim bladder, of freshwater fish, Effect of asphyxiation on, 209.

Gastropod, A new species of, from Baffin Land, 50.

Grasshoppers, See Insects.

Ground squirrel, as possible carrier of encephalomyelitis, 321.

Gulls, Herring, Non-infection of, by cercariae, 175.

Gyraulus parvus, examined for species of cercariae, 174.

Haemoglobin, See Blood.

Haemolysis, Effect of phenothiazine on, in horses, 283, 349.

Haemonchus, Control of, in sheep, 115.

Hawk, as possible carrier of encephalomyelitis, 321.

Heart-beat frequency in embryos of salmon and trout, Effect of temperature on the critical oxygen pressure for, 1.

Heliosoma trivolvis, examined for presence of cercariae, 174.

Heliothis, See Insects (Boll-worm).

Helminth parasites, See Parasites.

Hen, as possible carrier of encephalomyelitis, 321.

Hepatogenesis of the Atlantic salmon, 79.

Horse, See Blood and Virus.

Humidity, Effect of, on preservation of eggs, 306.

Hybocodon prolifer, a new record from Arctic water, 71.

Hymenoptera, See Insects.

Insects
Apanteles carpatus (Hymenoptera), Life cycle of, 13.
Assassin bug, as possible carrier of encephalomyelitis, 321.
Boll-worm, Analysis of distribution of, in maize, 235.
Crickets, as possible carriers of encephalomyelitis, 321.
Diptera, Premeiotic orientation and initiation in pairing in chromosomes of the, 221.
Grasshoppers, as possible carriers of encephalomyelitis, 321.
Mosquito, as possible carrier of encephalomyelitis, 321.
Moth, Webbing clothes, Life cycle of Apanteles, a parasite of, 13.
Neodiprion, Pachytene observations at meiosis in, 368.
Stomoxys, as possible carrier of encephalomyelitis, 321.
Tabanidae, Members of, as possible carriers of encephalomyelitis, 321.
Ticks, as possible carriers of encephalomyelitis, 321.

Intestines of shad and mackerel, Vitamin A and D potency of, 167.

Iron, Reduced, Effect of, on weight of young pigs, 380.

Larva, Salmon, Changes in, during development, 108.

Lepidoptera, See Insects.

Lepomis gibbosus, See Pumpkin-seed.

Light, Effect of, on haemolysis of horse erythrocytes in presence of phenothiazine derivatives, 288.

Liver
of chicken, Effect of ethyl alcohol and tricresol on vitamin A content of, 47.
of mackerel, Vitamin A and D potency of, 167.
of salmon
Development of, 79.
Morphology of, 94.
of shad, Vitamin A and D potency of, 167.

Lymnaea stagnalis jugularis, examined for presence of cercariae, 174.

Lysolecithin, Haemolysis of erythrocytes by, 287.

Mackerel, Vitamin A and D potency of oil of, 167.

Macroplankton, See Plankton.

Maize, Mathematical analysis of distribution of Heliothis armigera in, 235.

Meat, See Bacon and Chicken.

Medusae from the Canadian eastern Arctic, 71.

Meiosis
Pachytene observations in Neodiprion, 368.
Premeiotic orientation and the initiation of pairing in Diptera, 221.

Metopa longirama, a new amphipod species from the Canadian eastern Arctic, 39.

Micro-organisms, See Bacteria and Fungi.

Micropterus dolomieu, See Bass.

Mollusc(s)
A new, from Baffin Land, 50.
from the Canadian Arctic, 75.

Moniezia, Control of, in sheep, 115.

Monodontus, Control of, in sheep, 115.

Mosquito, See Insects.

Moth, See Insects.

Moulds
as egg contaminants, 293, 300, 307.
Inhibition of growth of, on eggs at ordinary temperature, 57.

Mus, See Rat.

Muscle tissue of fish, Value of pH as measure of, 20.

Nematodirus, Control of, in sheep, 115.

Neodiprion, See Insects.

Oesophagostomum, Control of, in sheep, 115.

Offal of shad and mackerel, Vitamin A and D potency of, 167.

Oils of shad and mackerel, Vitamins A and D potency of, 167.

Onchidiopsis kingmaruensis, New species of mollusc from Baffin Land, 50.

Oncorhynchus Keta, Use of pH as measure of freshness in, 24.

Ostertagia, Control of, in sheep, 115.

Owl, as possible carrier of encephalomyelitis, 321.

Oxygen
in swim bladder of fish after asphyxiation, 209.
pressure, Effect of temperature on, for heart-beat frequency in embryos of salmon and trout, 1.

Parasites
Helminth, Control of, in sheep, 115.
Life cycle of Apanteles carpatus, parasite of webbing clothes moth, 13.

Penicillium citrinum, Inhibition of growth of, on eggs, 60.

Perca flavescens, See Perch.

Perch, Yellow, Effect of asphyxiation on swim bladder gases of, 209.

Pfrille neogaea, See Dace.

pH, Use of, as measure of freshness of fish muscle tissue, 20.

Pheasant, as possible carrier of encephalomyelitis, 321.

Phenothiazine
Effect of, on horses, 349.
Effect of derivatives of, on haemolysis, 283.

Photofluorometer, Measurement of fluorescence of egg powder by, 277.

Physella gyrina, examined for presence of cercariae, 174.

Physoclists, Effect of asphyxiation on swim bladder gases of, 209.

Physostomes, Effect of asphyxiation on swim bladder gases of, 209.

Pigeons, Non-infection of, by cercariae, 175.

Pigs
as possible carriers of encephalomyelitis, 321.
Relationship of blood haemoglobin concentrations to rate of gain in suckling, 380.

Pike, Proteus hydrophilus infections of, 161.

Pisobia malanotos, examined for presence of cercariae, 175.

Pista
moorei, new polychaete species from North Pacific, 204.
pacifica, new polychaete species from North Pacific, 202.

Plankton, Marine macroplankton from the Canadian eastern Arctic.
I. Amphipoda and Schizopoda, 33.
II. Medusae, Siphonophora, Ctenophora, Pteropoda, and Chaetognatha, 71.

Polarization and progression in pairing
in Diptera, 221.
in Neodiprion, 368.

Polychaeta from the North Pacific, 183.

Polyvinyl alcohol, Use of, in preserving eggs, 57.

Pressure, Critical oxygen, See Oxygen.

Proteus hydrophilus
Biochemical reactions of culture of, 164, 165.
Comparison of, from various sources, 164, 166.
Infections of pike, trout, and frogs by, 161.

Pseudobilharziella querquedulae, Completion of life cycle of, 170.

Pseudosuccinea sp., examined for presence of cercariae, 174.

Pteropoda from the Canadian eastern Arctic, 75.

Pumpkin-seed, Effect of asphyxiation on swim bladder gases of, 209.

Rabbit, as possible carrier of encephalomyelitis, 321.

Rancidity, Development of, in bacon during storage, 271.

Rat, as possible carrier of encephalomyelitis, 321.

Red leg of frogs, Proteus hydrophilus as cause of, 162.

Red sore of pike, Proteus hydrophilus as cause of, 161.

Salmon
Atlantic, Hepatogenesis of, 79.
Chum, Use of pH as measure of freshness in, 24.
eggs, Physical changes in developing, 99.
embryos, Effect of temperature on critical oxygen pressure for heart-beat frequency in, 1.

Salmo salar, See Salmon.

Salvelinus fontinalis, See Trout.

Sandpiper, Pectoral, examined for presence of cercariae, 175.

Saponin, Haemolysis of erythrocytes by, 285, 286.

Schistosomatidae and cercarial dermatitis in Manitoba, 170.

Schizopoda, See Plankton.

Scionella estevanica, new polychaete species from the North Pacific, 205.

Scomber scombrus, See Mackerel.

Sea duck, See Buffle-head.

Semotilus atromaculatus, See Chub.

Shad, Vitamin A and D potency of oil of, 167.

Sheep
Control measures for parasitic diseases of, 115.
See Blood.

Sinea diadema, See Insects (Assassin bug).

Siphonophora from the Canadian eastern Arctic, 75.

Snails, Species of, examined for presence of cercariae, 174.

Spatula clypeata, Pseudobilharziella in, 180.

Spoilage of eggs
Effect of oil treatment and egg case liner bags on, during storage, 297.
stored under constant and alternating temperatures and humidity, 310.
Surface contamination on egg-shell in relation to, 291.

Spot rot found in eggs, 300.

Stagnicola, Species of, examined for presence of cercariae, 174.

Stickleback, Brook, Effect of asphyxiation on swim bladder gases of, 209.

Stomoxys, See Insects.

Storage of eggs, See Spoilage.

Sucker, Common white, Effect of asphyxiation on swim bladder gases of, 209.

Swim bladder of freshwater fish, Effect of asphyxiation on gases of, 209.

Syllis stewarti, new polychaete species from the North Pacific, 191.

Tabanidae, Members of, as possible carriers of encephalomyelitis, 321.

Temperature(s)
Effect of, on critical oxygen pressure for heart-beat frequency in embryos of salmon and trout, 1.
Optimum, for Proteus hydrophilus, 163.
Ordinary, Treatment to maintain quality in eggs at, 57.
Preservation of eggs at varying, 306.

Ticks, See Insects.

Tineola bisselliella, Life cycle of Apanteles carpatus, a parasite of, 13.

Totanus flavipes, examined for presence of cercariae, 175.

Trematode(s) and cercarial dermatitis in Manitoba, 170.

Trichostrongylus, Control of, in sheep, 115.

Tricresol, Effect of, on vitamin A content of blood and liver of chicken, 47.

Trout
- Common brook, Effect of asphyxiation on swim bladder gases of, 209.
- Embryos, Effect of temperature on critical oxygen pressure for heart-beat frequency in, 1.
- Proteus hydrophilus infections of, 161.

Ulcer disease of trout, Proteus hydrophilus, as cause of, 161.

Valvata tricarinata, examined for presence of cercariae, 174.

Vaseline, Use of, in preserving eggs, 57.

Virus, Search for sources and carriers for equine encephalomyelitis, 321.

Vitamins
- Vitamin A
  - in blood and liver of chicken, Effect of ethyl alcohol and tricresol on, 47.
  - potency of shad and mackerel oil, 167.
- Vitamin C content of canned chicken, 230.
- Vitamin D potency of shad and mackerel oil, 167.

Water, Lake, Proteus hydrophilus in, 162.

Waterfowl, Studies of, in British Columbia, 133.

Water hardening of salmon eggs, 102.

Worms, See Parasites.

Yellow-legs, Lesser, examined for presence of cercariae, 175.

Yolk sac of salmon egg, 109.

Zelus audax, see Insects (Assassin bug).